U.S. Fire Administration

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Highway Vehicle Fires

FINDINGS

- One in every four fire department responses is to a vehicle fire. This does not include the tens of thousands of responses to vehicle accident sites.
- Mechanical or design problems are the leading cause of vehicle fires.
- Electrical wiring and fuel are the leading forms of material ignited in vehicle fires.
- Fires following a collision are the leading cause of vehicle deaths.
- Mechanical and design failures are the leading cause of vehicle injuries, many of which were due to the victim's attempt to control the fire.

From 1996 to 1998, the National Fire Protection Association estimated an annual average of 377,000 highway vehicle (automobiles, vans, trucks) fires. (Highway vehicle fires represent more than 96% of all mobile property fires.) Each year, these fires resulted in an average of approximately 515 deaths, 3,000 injuries, and $1.1 billion in property loss.[1]

This report addresses the characteristics of 1998 highway vehicle fires. Data are from the National Fire Incident Reporting System (NFIRS). Figure 1 compares losses from vehicle fires with those of all reported fires averaged over a 3-year period (1996–98).

In 1998, nearly one-quarter of all fire department responses were to vehicle fires—more than the responses to residential properties. Two-thirds of these fires are the result of mechanical or design problems (Figure 2), such as broken fuel lines, faulty catalytic converters, electrical failures, blown tires, and overheating.

Arson is the second leading cause of vehicle fires at 18%. Many automobile fires are not investigated for possible arson, although some insurance companies privately investigate obvious cases. Arson fires reported to NFIRS, therefore, may be undercounted.

Figure 1. Loss Measures for Vehicle Fires
(1996–1998 NFIRS data)

MEASURE	ALL FIRES	HIGHWAY VEHICLE FIRES
Dollar Loss/Fire	$11,271	$3,166
Injuries/1,000 Fires	48.0	5.0
Fatalities/1,000 Fires	7.7	1.6

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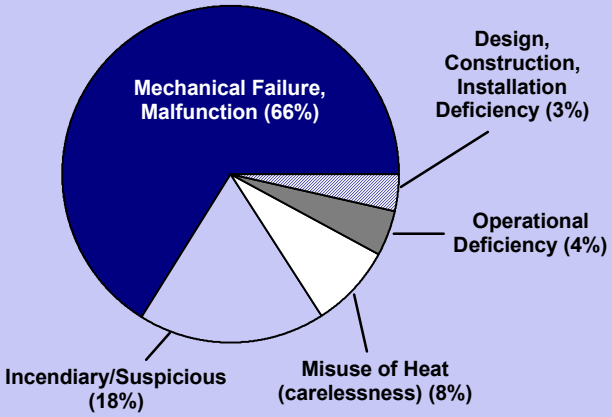
Carelessness (human act) accounts for 8% of highway vehicle fires. Examples of carelessness include cigarettes dropped on the upholstery; distractions while driving, such as eating or cell phone use; parking over dry leaves with a hot catalytic converter; and misuse of flammable liquids, especially gasoline, while servicing or maintaining the car.

Figure 3 shows that electrical wiring is the leading form of material ignited (30%), followed by fuel (29%).

Figure 2. Causes of Highway Vehicle Fires (1998)



Most highway vehicle fire deaths (64%) are the result of a collision. Determining the cause of death following a collision, however, is often difficult. Was the death the direct result of the collision or the fire that ensued? A fire fatality should be counted only if a person was trapped and killed by the fire, rather than killed on impact and subsequently exposed to the fire.

The contributing factor (or condition preventing escape) in 68% of vehcile fire deaths was either rapid fire progression (51%) or that the victim was incapacitated prior to ignition (16%).

Collisions are only the third leading ignition factor for injuries. The leading factor is mechanical/design failures (43%). Carelessness (or human act) accounts for 30% of highway vehicle injuries.

Forty-five percent of persons injured in a vehicle fire were injured while attempting to control the fire. An additional 21% were injured trying to escape the blaze. A fraction (11%) of the injured were incapacitated prior to ignition.

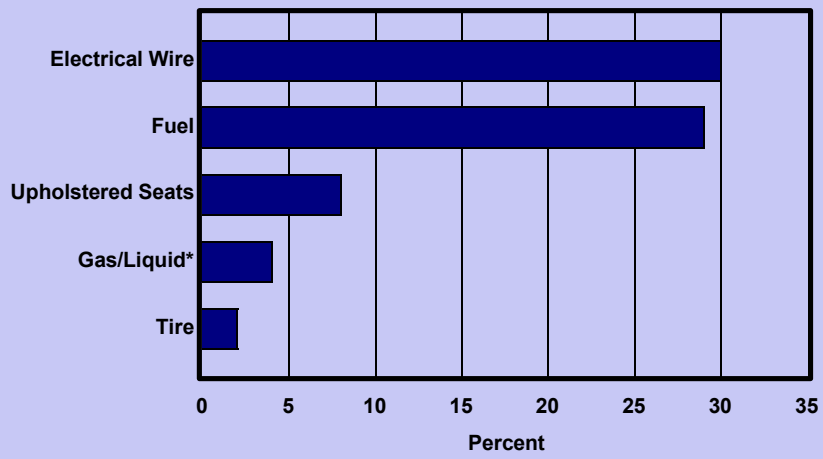
EXAMPLES

- A minivan caught fire after an explosion inside the vehicle. Gas leaked from a propane tank that had just been filled, and the driver lit a cigarette.[2]

- In Howell Township, New Jersey, a tow truck was winching a 1992 Isuzu Rodeo onto ints flatbed. The Isuzu had a fuel leak that caught fire from the friction. The Isuzu caught fire and was a total loss.[3]

- A pickup pulled into high weeds. The hot catalytic converter started a fire in the weeds that quickly engulfed the car. Two babies in car seats were trapped inside, but were rescued by firefighters.[4]

Figure 3. Form of Material Ignited in Highway Vehicle Fires (1998)



*Gas or flammable liquid in a pipe or container

For further information, contact your local fire department or the USFA.

To review the detailed methodology used in this analysis, click **METHODOLOGY**

Footnotes:

1. National estimates are based on the National Fire Protection Association's (NFPA) annual survey, *Fire Loss in the United States*.
2. *Firehouse Magazine*, September 1998.
3. *Freewood Acres Fire Company Incident Report*, February 2000.
4. "Fireworks Keep Texas Firefighters Busy," *Firehouse Magazine*, July 2000.